

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Fabio Alberto Alzate Martinez
Student number	5510406

Studio		
Name / Theme	Transitional Territories – Accumulation/Clearance	
Main mentor	Diego Andres Sepulveda Carmona	Spatial Planning
Second mentor	Fransje Hooimeijer	Water management and Design
Argumentation of choice of the studio	The suggested frameworks and guidance from the studio Transitional Territories were highly beneficial regarding the depth of the project's interdisciplinary dimensions. Also, the initial essentials and intensive course offered by the studio were valuable during the conceptualization of the research aim, providing a solid structure for investigation and critical feedback. The experience in highly transformative landscapes under climate extremes, with a water-soil ecosystems-sensitive approach, makes Transitional Territories a design and research laboratory aligned with the main research topics. Then, providing essential knowledge on how to research and design landscape systems, and their repercussions in diverse scales of design and domains.	

Graduation project	
Title of the graduation project	The Agro-Urban Nexus, Envisioning a healthy evolutionary coexistence in Flevoland.
Goal	
Location:	Flevoland - Netherlands
The posed problem,	<p>Problem Statement:</p> <p>A) Flevoland operates an intense industrialized agriculture system towards global food exportation, which causes intense ecological deterioration and soil subsidence, compromising the European agenda of Natura 2000, due to the nitrogen emission.</p> <p>B) However, the environmental degradation was a historical problem since the Flevopolders were reclaimed, since the dike system created hard edges on the border lakes, that were separated from the Rhine - Wadden Sea interaction when</p>

	<p>the Zuiderzee was enclosed. Hence, destroying the brackish water ecosystem as a consequence of the implementation of water defense infrastructure.</p> <p>C) Current and future urban expansion ambitions in Almere due to its infrastructural connectivity to the Randstad, are putting pressure on the fragilized soil-water system, also, incrementing a demand for food that is not being supplied regionally.</p> <p>D) All of these landscape transformations are happening under the sea-level rise vulnerability of Flevoland's low land.</p> <p>Domains: A) Agriculture B) Environment C) Housing D) Climate change</p>
<p>research questions and</p>	<p>Main Research Question:</p> <p>What are the necessary agro-urban (A, C) spatial transformations to achieve an evolutionary (D) healthy (B) agro-urban regional future?</p> <p>Sub Research Questions:</p> <p>Q1) A + B = How to integrate agricultural activities with ecosystem services and biodiversity restoration?</p> <p>Q2) B + C = How can spatial planning reduce urban land use trade-offs towards ecological restoration?</p> <p>Q3) C + D = How to implement flooding consequence reduction strategies in new and existing urban development?</p> <p>Q4) D + A = How to implement flooding consequence reduction strategies in new agroecosystem development?</p>

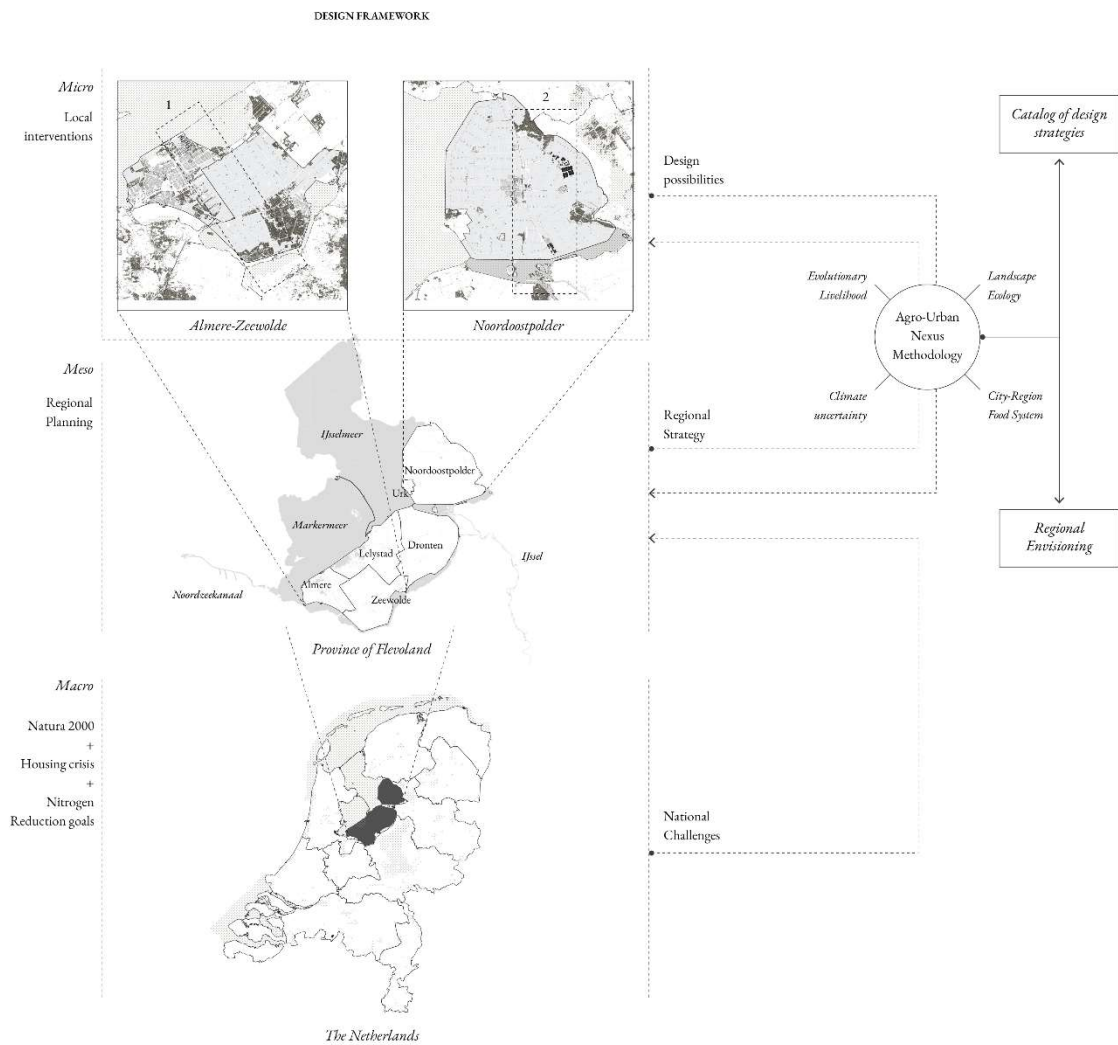
	<p>Q5) B + D = How can the restoration of the border lake's ecosystem be integrated with the transformation of water defense infrastructure?</p> <p>Q6) A + C = How to design integrated agro-urban spatial strategies with regenerative landscape transformations to attend the urbanization demands in Flevoland?</p>
<p>design assignment in which these result.</p>	<p>1 - Regional envisioning of Flevoland for 2120, expressed through territorial, and regional drawings.</p> <p>2 - Catalog of local design strategies will support the regional envisioning by bridging adaptation phases of socioecological and cultural systems towards climate uncertainty, while also indicating the necessary landscape transformations that can bridge regional, municipal, and private initiative responsibilities.</p>
<p>The design process is concentrated in the Regional and Local scales, allowing the elaboration of regional planning strategies and local design interventions. The planning strategies work in iteration with local design possibilities, allowing the identification of potentials to increase the systems redundancy and strategic capacity during uncertain climate futures. The local interventions are focused on two areas that presents important landscape interconnected challenges:</p> <p>1 - Almere-Zeewolde:</p> <p><i>Challenges:</i> This area is determined to offer an extensive housing expansion. In contrast, it also presents severe degrees of subsidence, and several ecological problems, ranging from the high turbidity and lack of biodiversity from the Merkermeer, to the disconnection of the local forest areas and the Natura 2000 protected areas. The disconnection is present across intensive agriculture and energy production areas.</p> <p><i>Leverages:</i> Almere and Zeewolde are a place of agro-urban innovation since their formation, having several propositions of urban agriculture systems, and bottom-up productive areas. Also, it is close to the Randstad, having good connections with Amsterdam and the North Sea Canal.</p> <p><i>Potentials:</i> Develop an integrated housing expansion with solutions to reduce flooding consequences, in synergy with stronger connections within the dynamic of second-tier cities and a regional food system. Hence, agroecological areas also can promote restorative and connecting ecological functions, combined with gradual dike depoldering strategies.</p> <p>2 - Noordoostpolder:</p> <p><i>Challenges:</i> This area presents a high level of nitrogen emissions, an ongoing intensification of agricultural land use, and the expansion of glasshouse areas. This is linked to the increased vacancy in the smallholder farms, related to the expansion of bigger operations and lack of successors in existing farms. Also, it borders the IJssel delta, being a crucial space to start the ecological restoration in the IJssel - IJsselmeer - Wadden Sea system.</p>	

Leverages: It presents a polynuclear set of small settlements, and small-scale farm properties, which facilitates the implementation of a regional food agroecosystem.

Potentials: This area can integrate forest fragments, agroecological activities, and the delta dynamics, being crucial to explore possible adaptations and design strategies in areas with higher agricultural land-use predominance.

The combination of the design strategies extracted from these intervention areas will base an evolutionary regional envisioning for Flevoland, indicating pathways of adaptation and its necessary landscape transformations.

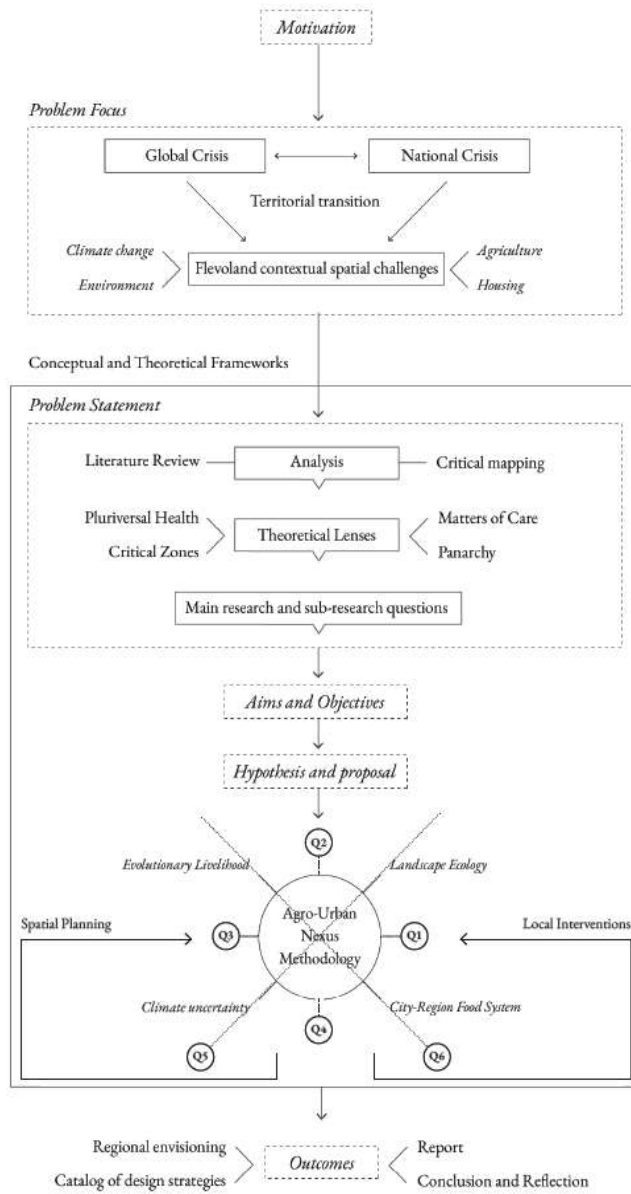
Design Framework



Process

Method description

Methodological Framework



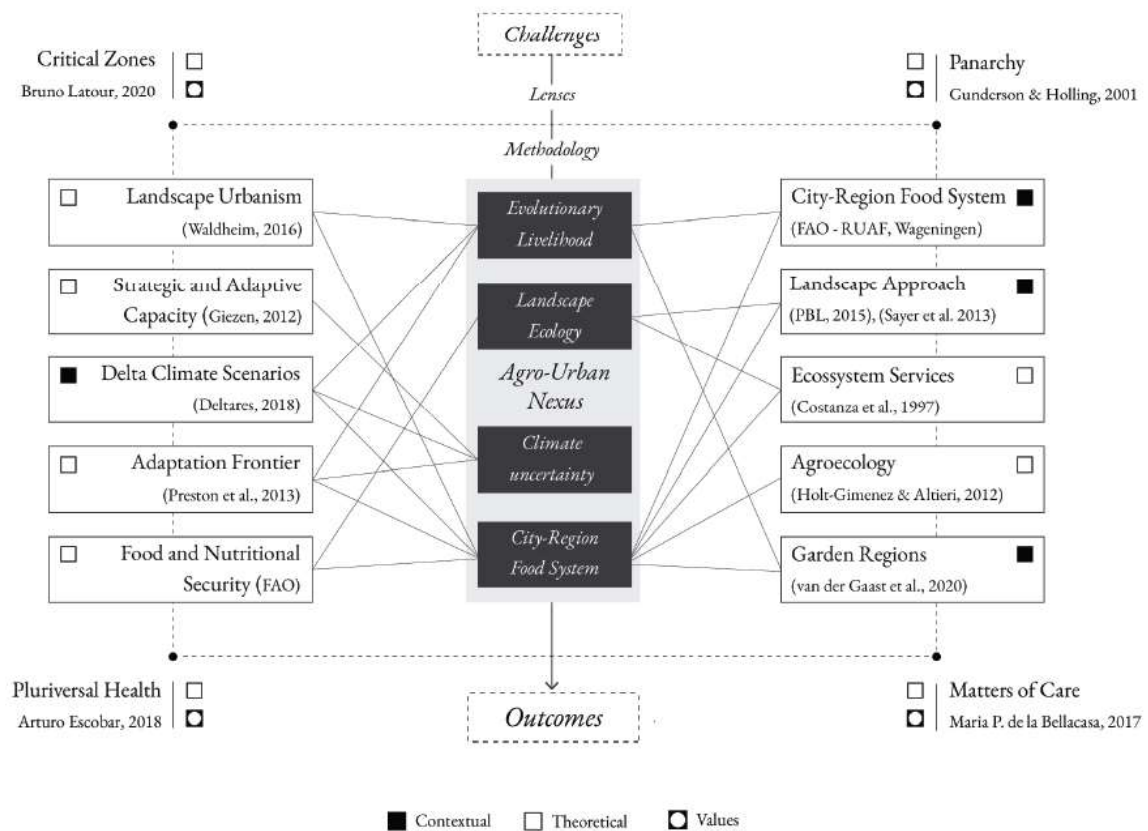
The research started by the definition of the problem focus, based on the repercussion of the global climate uncertainty and environmental crisis, and the national crises of intensive agriculture, and housing. Here, the domains of the contextual spatial challenges for Flevoland are unveiled by a series of critical mapping supported by literature review. And the interpretation of this analysis will be carried within the ethical-value lens of Critical Zones, Pluriversal Health, Panarchy, and Matters of Care.

Then, the design process on the scales of spatial planning and local interventions, will be carried out through an agro-urban nexus of design principles able to unveil the contextual spatial critical interdependencies and opportunities in Flevoland. The agro-urban nexus is projective and embraces Evolutionary Livelihood, Landscape Ecology, Climate Uncertainty, and City region food systems as design guidelines. It is based on the identified domains that intersect the spatial challenges in Flevoland, and it is strengthened by a multi-domain theoretical body of knowledge, hence allowing the explicit recognition of trade-offs and synergies between the projective objectives for Flevoland.

Moreover, the nexus also operates within the theoretical principles of the Critical Zones, Pluriversal Health, Panarchy, and Matters of Care as guiding values. Therefore, the project aims to have the perception of the multi-layered impact of the design interventions and strategies on the delicate interdependent socio-ecological system of Flevoland's territory.

Literature and general practical preference

Theoretical Framework



Theoretical Underpinning:

Theoretical Lenses:

Critical Zones (Latour, 2020): the definition adopted for this thesis is based on the revision of Bruno Latour about the Earth Sciences concept of Critical Zones. Hence, adding the decision-making, political, and socioeconomic dimensions of the multilayered interactions that sustain life through geochemical cycles and living organisms' interdependencies.

Panarchy (Gunderson & Holling, 2001): is a framework of nature's transitions across time, recognizing the function of systems at multiple scales of space, social order, and natural dynamics. It aims to connect adaptive cycles in nested hierarchies, in which the adaptive cycle's phases have different levels that are intertwined by revolt and remember moments, in a way that slower and larger levels set conditions for the functioning of smaller and faster levels.

Pluriversal Health (Escobar, 2018): this definition is a holistic framing of health as a qualitative characteristic of the interaction between systems, fundamental to weaving and healing the web of life. It is conceived within a broader pluriversal cosmology that incorporates the diverse knowledge of different worldviews that share the planet, especially the ones that are aligned with social justice and the systemic character of life. Health then becomes a provider of life's necessities, in the physical, emotional, and spiritual dimensions.

Matters of Care (de la Bellacasa, 2017): the 'matters of care' is an ethical and political positioning that acknowledges humanity's responsibility of expanding the web of care by balancing the human subject position among natural webs of care to reorganize human-nonhuman relations towards the envisioning of non-exploitive forms of co-existence.

Nexus guidelines and theoretical intersections:

Evolutionary Livelihood: it is based on the necessity of adapting the contextual livelihood elements, such as socio-economic activities, housing, food production systems (FAO-Ruaf, Wageningen; van der Gaast et al., 2020), and cultural movements, in order to maintain social order along the natural transitioning movements during climate change uncertainty. It is established through the theoretical framework of Landscape Urbanism (Waldheim, 2016), in which the landscape transformations and conditions are intrinsically related to the formation and functioning of the urbanized landscape. It is placed in the context of the Delta socio-economic climate scenarios for the Netherlands (van de Brugge & Bruggeman, 2018) denominated "steam" (rapid climate change + socio-economic growth) and "warm" (rapid climate change + socio-economic shrinkage). Hence allowing a comparative assessment of the safety of possible design outcomes in different futures, towards the safe operability of systems in the Climate Adaptation Frontier (Preston et al., 2013)

Landscape Ecology: this guideline responds to the environmental restoration process that must comprise the ecological interdependencies in the natural ecosystems intertwined with human activities that share the same landscape structures and backbones. It is based on one hand in the Landscape Approach (van der Horn & Meijer 2015; Sayer et al., 2013), which is a framework largely adopted in the Netherlands, that acts in the relation between the landscape hybrid functions with shared and opposed interests among stakeholders. In that sense, it aims to achieve landscape transformations by the identification of entry points, leverages, and value convergence. The hybrid functions of the landscape, on the other hand, are highly dependent on the provision of Ecosystem Services (Costanza et al., 1997), which allows the maintenance of natural ecosystems, and the soil-water capacity for productive activities of the landscape, essential to ensure Food and Nutritional Security, that according to the Food and Agriculture Organization (FAO) is based on the pillars: availability, accessibility, utilization, and stability.

Climate Uncertainty: this is a fundamental condition that becomes a strong guideline for the design of evolutionary solutions. It is established within the correlation between the socioeconomic climate scenarios from Deltares (van de Brugge & Bruggeman, 2018), and the desirable safety operability of systems during climate adaptation (Preston et al., 2013). Hence, placing environmental uncertainty is a pivotal element in planning. In that sense, spatial planning must navigate adaptive strategies through climate uncertainty and complexity, by providing adaptive capacity and strategic capacity (Giezen, 2012) to achieve desired outcomes.

City-region food system: regional food system is a concept that is defined by the operation of a food system within the regional scale of a landscape (PBL, 2015; Sayer et al., 2013) that provides Food and Nutritional Security by supporting food availability, accessibility, utilization, and stability (FAO). It is the core of Flevoland's future, using the robust food infrastructure and extensive patches of small and medium farms as leverage to promote an agroecological system (Holt-Gimenez & Altieri) capable of regenerating ecosystem services (Constanza et al., 1997), while creating an identity within a garden region composed by second-tier cities (van der Gaast et al., 2020), such as Almere. Therefore, this approach integrates food as a core for the landscape urbanism approach (Waldheim, 2016), aiming for

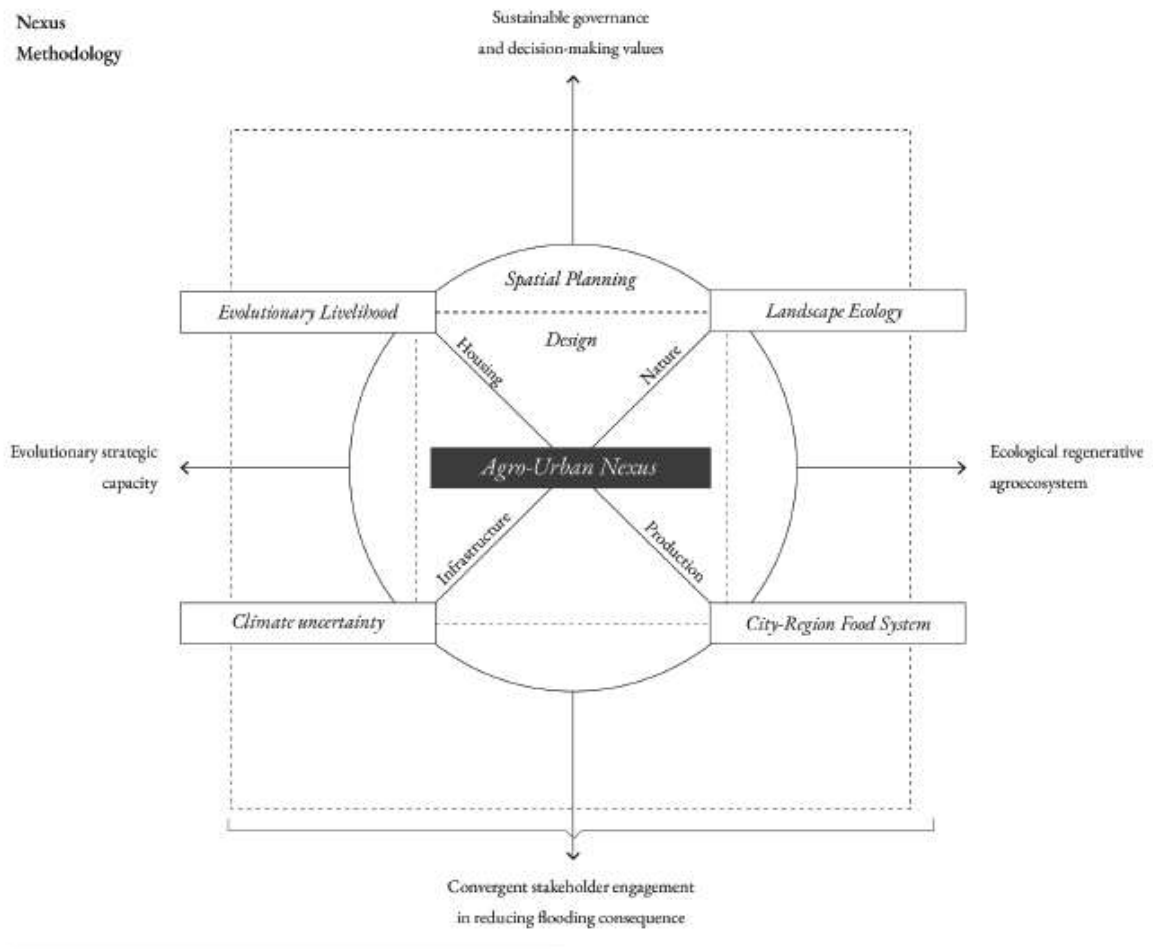
a safe adaptation (Preston et al., 2013) to climate uncertain futures for the Netherlands towards an evolutionary non-exploitive human-nature coexistence.

Conceptual Framework

	<i>Global crisis</i>		<i>National crisis</i>	
Domains	<i>Climate change</i>	<i>Environment</i>	<i>Agriculture</i>	<i>Housing</i>
Challenges	SLR uncertainty Flooding risk	Natura 2000 agenda Ecosystem services and biodiversity loss	Industrialized agriculture Nitrogen reduction agenda	Soil-water pressures Almere urban expansion
Theoretical lenses	<i>Pluriversal Health</i>	<i>Critical Zones</i>	<i>Matters of Care</i>	<i>Panarchy</i>

Hypothesis *Flevoland cannot feed the world any longer, however, it can show and support the world on how to achieve a regional food system. Taking care of its population and environment through a healthy agro-urban development that evolves during climate uncertainty* To achieve it, it is proposed an agro-urban nexus based on interdependent spatial planning scopes, reducing socio-ecological trade-offs and promoting sustainable synergies in Flevoland to design an evolutionary healthy agro-urban regional future.

Nexus Methodology



Outcome Flevoland territorial evolutionary transformation
Regional envisioning + catalog of local interventions

Core Bibliography:

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de la Bellacasa, M. (2017). *Matters of care: Speculative ethics in more than human worlds*. University of Minnesota Press.

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Reflection

Reflection

The contemporary role of urbanism in facing the multiscale impact of global challenges is becoming increasingly complex. It demands a deep understanding of the temporal dynamics of the systemic interdependencies between life, society, and geology. And by revealing this complex system, we can understand that our future does not reserve space for any strict determinism. And when reading the several levels of uncertainties through holistic lenses, we also reveal new possibilities of how, and to what extent, planning and design can indicate paths towards a non-harmful human coexistence with the web of life and natural temporal dynamics.

The approach from the studio Transitional Territories was essential for my educational process of understanding how some processes and conditions, that at first sight were disconnected, have a crucial interrelation. Essential to dive into the critical questions and transitions that are embedded in temporal dynamic territories. Then, allowing the research process to inquire critical questions about latent observable challenges, and finding answers by reading the space and the effects of time in the socioecological systems within a territory.

After the first year of urbanism and the first half of my graduation year, my way of positioning myself within my profession, which deals with a complex world, gain maturity. Which gave me the confidence to ask harder questions and find suitable lenses and methodologies to answer those questions. During, and after, this intense process of graduation, I hope to contribute to a larger human movement that critically understands the necessity of caring about our planet. And I hope to gain clarity on which narratives of coexistence we should adopt for our present and future generations.

Relevance

The project deals with the intersection of major global and regional crisis. Expressed in Flevoland through the degradation of the water-soil biophysical structures, the demand for housing expansion, the socioenvironmental limits of intense agriculture, and the vulnerability towards sea level rise uncertainty. The proposed outcomes of this project, envisioning and design strategies, can contribute to the necessary and vibrant discussion of how to deal with those crisis through design. Presenting possible and feasible narratives of future coexistence. In this process, also it adds to the theoretical discussion of the holistic integrations of food into urban planning, largely explored in the last years. Hence, provided a different approach that is based on interdependencies with other systems, in both regional and local scales. Finally, the project is also inserted in a paradigmatical shift in the Netherlands regarding flooding prevention and defense, due to future climate uncertainty. Therefore, it also can be a test ground for contextualized possibilities of new measures, such as reducing flooding consequence. Exploring possible futures of agro-urban development within cycles of adaptation towards a natural continuum.